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OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, P.C.
1940 DUKE STREET
ALEXANDRIA, VA 22314

EXAMINER	
DOTE, JANIS L	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patentdocket@oblon.com
oblonpat@oblon.com
jgardner@oblon.com

Office Action Summary	Application No.	Applicant(s)	
	09/679,480	SUZUKI ET AL.	
	Examiner	Art Unit	
	Janis L. Dote	1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 April 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *84-86* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *84-86* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date. _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicants' submission filed on Apr. 16, 2008, has been entered.

2. The examiner acknowledges the cancellation of claims 54-70 and 79-83 and the addition of claims 84-86 filed on Apr. 16, 2008. Claims 84-86 are pending.

3. The prior rejections under 35 U.S.C. 103(a) of claims 54-70 and 79-83, set forth in the office action mailed on Jan. 16, 2008, paragraphs 5-14, have been mooted by the cancellation of those claims filed on Apr. 16, 2008.

The rejections of claims 54-70 and 79-83 under the ground of nonstatutory obviousness-type double patenting over claims 1-5 of U.S. Patent No. 7,192,677 B2 (Suzuki'677), set forth in the office action mailed on Jan. 16, 2008,

paragraphs 18-23, have been mooted by the cancellation of those claims filed on Apr. 16, 2008.

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 84-86 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 84 is indefinite in the phrase "wherein n is an integer of from 8 to 25." None of the formulas (III-3), (III6), (S-1), (S-2), and (S-3) include the symbol "n." It is not clear to what "n" refers.

6. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

7. Claim 84 is rejected under 35 U.S.C. 103(a) as being unpatentable over Japanese Patent 8-029998 (JP'998), as evidenced by applicants' admission at page 31, lines 9-11, of

the instant specification (applicants' admission I), combined with Japanese Patent 07-295250 (JP'250), and Schaffert, Electrophotography, p. 50 and Fig. 4a, and US 4,468,110 (Tanigawa).

See the DERWENT machine-assisted translations of JP'998 and JP'250, and the Japanese Patent Office (JPO) machine-assisted translation of JP'998 for cites.

JP'998 discloses an electrophotographic sensitive body, also known in the electrophotographic arts as a photoreceptor, comprising a conductive aluminum drum, an intermediate layer, a charge generation layer, and a charge transport layer. The charge generation layer comprises 3 parts by weight of a τ-form metal-free phthalocyanine pigment and 3.5 parts by weight of the asymmetric bisazo pigment (I)-24. DERWENT translation, Table 1-(5) at page 17, compound (I)-24; paragraphs 0035, 0036, 0042, and 0043; and example 8 in paragraph 0047; and JPO translation, paragraph 0035, lines 4-5. The weight ratio of phthalocyanine pigment to bisazo pigment is 3:3.5, which is within the range of 1:5 to 5:1 recited in instant claim 84. The JP'998 compound I-24 meets the limitations of formula VII recited in instant claim 84. JP'998 further discloses that the asymmetric bisazo pigment can equally be the asymmetric bisazo

pigment of formula I-29, which meets the limitations of formula VIII recited in instant claim 84. DERWENT translation, Table 1-(7) at page 19, and example 9 in paragraph 0047. In examples 8 and 9, the intermediate layer has a layer thickness of 0.1 μm, which is outside the range of "3 to 10 μm" recited in instant claim 84. (Note that the DERWENT translation of paragraph 0035 is missing the text in lines 4-5 of the JPO translation.) However, JP'998 teaches that the intermediate layer may have a layer thickness of "0 to 10 μm." DERWENT translation, paragraph 0031. The upper limit, "10 μm," of JP'998 range is within the range "3 to 10 μm" recited in instant claim 84. There is also substantial overlap of the range disclosed by JP'998 and the range of "3 to 10 μm" recited in instant claim 84.

According to JP'998, its photoreceptor has high spectral sensitivity in the visible light to the near infrared region. DERWENT translation, paragraph 0004.

JP'998 does not exemplify a photoreceptor comprising an intermediate layer comprising titanium oxide as recited in instant claim 84.

However, JP'998 discloses that a fine-powder pigment of a metallic oxide, such as titanium oxide, may be added to the

binder resin of its intermediate layer to prevent the occurrence of moire and to reduce the residual electric potential of the photoreceptor. DERWENT translation, paragraph 0030. These are the same benefits sought by applicants. See the instant specification, page 31, lines 9-11.

It would have been obvious for a person having ordinary skill in the art, in view of the teachings of JP'998, to add the metal pigment titanium oxide to the intermediate layer having a thickness of 10 μm in the photoreceptor disclosed by JP'998. That person would have had a reasonable expectation of successfully obtaining an electrophotographic photoreceptor that has high spectral sensitivity in the visible light to the near infrared region and that prevents the occurrence of moire and exhibits a reduction in residual electric potential.

JP'998 also does not disclose that the charge transport layer comprises a sulfur-containing compound as recited in the instant claims. However, JP'998 discloses that the charge transport layer can comprise an antioxidant, such as a sulfur-based compound. DERWENT translation, paragraph 0027.

JP'250 discloses sulfur-containing compounds that meet the compositional limitations of formulas (III-3), (III-6), (S-1), (S-2), and (S-3) recited in the instant claims. JP'250

discloses that said sulfur-containing compounds can be used as antioxidants in charge transport layers of photoreceptors. DERWENT translation, paragraph 0007, compounds (I-1) and (I-4) at paragraph 0026, and compounds (II-1) to (II-3) at paragraph 0028. JP'250 exemplifies a charge transport layer comprising 1.5 parts by weight of the sulfur-containing antioxidant per 100 parts by weight of the charge transport material. The amount of 1.5 parts by weight was determined from the information provided in the DERWENT translation, paragraph 0050. The amount of 1.5 parts by weight per 100 parts by weight of the charge transport material is within the range of "0.9 to 5 parts by weight . . . based on 100 parts by weight" of the charge transport material recited in instant claim 84. JP'250 discloses that said sulfur-containing compounds prevent the deterioration of the photoreceptor due to ozone in the ambient air or due to strong light irradiation. The photoreceptor is said to have improved potential stability over long periods of time. DERWENT translation, paragraphs 0003, 0006, and 0007, and paragraph 0054, lines 1-13. JP'250 further teaches that its sulfur-containing antioxidants provide photoreceptors with improved stability of electrification and sensitivity over long periods of time compared to known hindered

phenol antioxidants. DERWENT translation, Table 1, example 1 and comparative examples 3 and 4, and paragraph 0054, lines 14-18.

It would have been obvious for a person having ordinary skill in the art to use JP'250's sulfur-containing compounds that meet the compositional limitations of formulas (III-3), (III-6), (S-1), (S-2), or (S-3) recited in the instant claims, in an amount of 1.5 parts by weight per 100 parts by weight of the charge transport material in the charge transport layer, as the antioxidant in the photoreceptor rendered obvious over the teachings of JP'998. That person would have had a reasonable expectation of successfully obtaining a photoreceptor that has improved potential stability over long periods of time and that provides stable toner images after many repeated copies.

The recitation, "the photoreceptor is suitable for a reverse developing method in an electrophotographic image forming apparatus which comprises a contact charger," in claim 84 is merely a statement of intended use that does not distinguish the photoreceptor rendered obvious over the combined teachings of the cited prior art. A recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in

order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. It is well known in the electrophotographic arts that that the "production of positive prints from line negatives requires only a change of the xerographic developing material." See Schaffert, p. 50, section 2.6.1, lines 1 and 2. According to Schaffert, "[w]hen a xerographic plate sensitized with positive charges is exposed to a line negative, the image areas are discharged and the nonimage areas remain charged . . . because of the fringe field effect, negative charges will be induced on the surface of the xerographic plate near the edges of the image areas. Such an area is represented at E in Fig. 4a. Now, if the plate is developed with an electropositive developer, the positively charged toner will be attracted to the induced negative charges, and a photographically positive image is developed." Schaffert further teaches that in the case of xerographic plates requiring negative sensitization, an electronegative developer would be used. See Schaffert, page 50, section 2.6.1, lines 4-13, and Fig. 4a. According to Tanigawa, "in reversal development, there is used a developer charged with the same polarity as that of the latent image background portion of the photosensitive

medium. The developer is applied to the latent image portion where the charge on the surface of the photosensitive medium has been decayed by the laser beam exposure." Tanigawa, col. 1, lines 49-55. As discussed above, the photoreceptor rendered obvious over the combined teachings of the cited prior art meets the photoreceptor limitations recited in the instant claims. Thus, on the present record, the intended use recited in instant claim 84 does not appear to result in a compositional or structural difference between the photoreceptor recited in the instant claims and the photoreceptor rendered obvious over the combined teachings of the cited prior art.

8. Claim 85 is rejected under 35 U.S.C. 103(a) as being unpatentable over JP'998, as evidenced by applicants' admission I, combined with JP'250, Schaffert, and Tanigawa, as applied to claim 84 above, further combined with US 4,507,374 (Kakuta), as evidenced by applicants' admission at page 21, lines 11-19, of the instant specification (applicants' admission II), and DERWENT abstract Acc. No. 1983-816039. See the DERWENT translations of JP'998 and JP'250, and the JPO translation of JP'998 for cites.

The claim is rejected for the reasons discussed in the office action mailed on Apr. 17, 2007, paragraph 10, which is incorporated herein by reference.

9. Claim 84 is rejected under 35 U.S.C. 103(a) as being unpatentable over Japanese Patent 7-128890 (JP'890), as evidenced by applicants' admission I, combined with JP'250, Schaffert, and Tanigawa. See the DERWENT machine-assisted translations of JP'890 and JP'250 for cites.

JP'890 discloses an electrophotographic sensitive body, also known in the electrophotographic arts as a photoreceptor, comprising a conductive aluminum drum, an intermediate layer, a charge generation layer, and a charge transport layer. The charge generation layer comprises 2.5 parts by weight of an X-form metal-free phthalocyanine pigment and 3 parts by weight of the asymmetric bisazo pigment (I-24). Translation, Table 1-(6) at page 19, compound (I)-24; paragraphs 0035, 0036, 0042, and 0043; and example 8 in paragraph 0047. (Note that the DERWENT translation paragraph 0042 incorrectly states that "3.0 weight parts and 2.5 weight-parts of X type metal-less phthalocyanines were added for the illustration compound (1)-24 disazo pigment." Paragraph 0042 in JP'890 states that

3.0 weight parts of the compound (1)-24 and 2.5 weight parts of X type metal-less phthalocyanine are used to form the charge generation layer.) The weight ratio of phthalocyanine pigment to bisazo pigment is 2.5:3, which is within the range of 1:5 to 5:1 recited in instant claim 84. The JP'890 compound I-24 meets the limitations of formula VII recited in instant claim 84. JP'890 further discloses that the asymmetric bisazo pigment can equally be the asymmetric bisazo pigment of formula I-29, which meets the limitations of formula VIII recited in instant claim 84. DERWENT translation, Table 1-(7) at page 20, and example 9 in paragraph 0047. In examples 8 and 9, the intermediate layer has a layer thickness of 0.1 μm, which is outside the range of "3 to 10 μm" recited in instant claim 84. However, JP'890 teaches that the intermediate layer may have a layer thickness of "0 to 5 μm." Translation, paragraph 0031. The upper limit, "5 μm" is within the range "3 to 10 μm" recited in instant claim 84.

According to JP'890, its photoreceptor has high spectral sensitivity in the visible light to the near infrared region. Translation, paragraph 0004.

JP'890 does not exemplify a photoreceptor comprising an intermediate layer comprising titanium oxide as recited in

instant claim 84. However, JP'890 discloses that a fine-powder pigment of a metallic oxide, such as titanium oxide, may be added to the binder resin of its intermediate layer to prevent the occurrence of moiré and to reduce the residual electric potential of the photoreceptor. Translation, paragraph 0030. These are the benefits sought by applicants. See the instant specification, page 31, lines 9-11.

It would have been obvious for a person having ordinary skill in the art, in view of the teachings of JP'890, to add the metal pigment titanium oxide to the intermediate layer having a thickness of 5 μm in the photoreceptor disclosed by JP'890. That person would have had a reasonable expectation of successfully obtaining an electrophotographic photoreceptor that has high spectral sensitivity in the visible light to the near infrared region and that prevents the occurrence of moire and exhibits a reduction in residual electric potential.

JP'890 does not disclose that the charge transport layer comprises a sulfur-containing compound as recited in the instant claims.

JP'250 discloses sulfur-containing compounds that meet the compositional limitations of formulas (III-3), (III-6), (S-1), (S-2), and (S-3) recited in the instant claims. JP'250

discloses that said sulfur-containing compounds can be used as antioxidants in charge transport layers of photoreceptors. The discussion of JP'250 in paragraph 7, supra, is incorporated herein by reference.

It would have been obvious for a person having ordinary skill in the art to use JP'250's sulfur-containing compounds that meet the compositional limitations of formulas (III-3), (III-6), (S-1), (S-2), or (S-3) recited in the instant claims in an amount of 1.5 parts by weight per 100 parts by weight of the charge transport material, as an antioxidant in the charge transport layer in the photoreceptor rendered obvious over the teachings of JP'890. That person would have had a reasonable expectation of successfully obtaining a photoreceptor that has improved potential stability over long periods of time and that provides stable toner images after many repeated copies.

The recitation, "the photoreceptor is suitable for a reverse developing method in an electrophotographic image forming apparatus which comprises a contact charger," in claim 84 is merely a statement of intended use that does not distinguish the photoreceptor rendered obvious over the combined teachings of the cited prior art. A recitation of the intended use of the claimed invention must result in a structural

difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. It is well known in the electrophotographic arts that that the "production of positive prints from line negatives requires only a change of the xerographic developing material." The discussions of Schaffert and Tanigawa in paragraph 7 above are incorporated herein by reference. As discussed above, the photoreceptor rendered obvious over the combined teachings of the cited prior art meets the photoreceptor limitations recited in the instant claims. Thus, on the present record, the intended use recited in instant claim 84 does not appear to result in a compositional or structural difference between the photoreceptor recited in the instant claims and the photoreceptor rendered obvious over the combined teachings of the cited prior art.

10. Claim 86 is rejected under 35 U.S.C. 103(a) as being unpatentable over JP'890, as evidenced by applicants' admission I, combined with JP'250, Schaffert, and Tanigawa, as applied to claim 55 above, further combined with US 3,357,989

(Byrne). See the DERWENT translations of JP'890 and JP'250 for cites.

The claim is rejected for the reasons discussed in the office action mailed on Arp. 17, 2007, paragraph 15, which is incorporated herein by reference.

11. Applicants' arguments filed on Apr. 16, 2008, as applicable to the rejections over JP'998 and the rejections over JP'890 set forth in paragraphs 7-10 above, have been fully considered but they are not persuasive.

Applicants assert that there is no motivation to use the organic sulfur antioxidant described in JP'250 in the photosensitive layers in the photoreceptors of JP'998 and JP'890. Applicants assert that none of the cited references recognizes the problem caused by using two kinds of pigments having different spectral sensitivity properties solved by applicants. Applicants also assert that JP'250 does not disclose or suggest that "the sulfur-containing antioxidants act effectively for the energy gap caused by the use of two or more charge generation materials and dissolving or decreasing the trap level." Applicants reference the data shown in Tables 14, 15, and 16 of the specification, as evidence of the "technical

effects (e.g., decrease in number of black spots and prevention of occurrence of background fouling)" produced by the addition of an organic sulfur-containing antioxidant as described in the present specification.

Applicants' assertions are not persuasive. The reasons for combining the teachings of the references do not have to be those of applicants. As admitted by applicants in the instant specification at page 4, lines 2-10, the use of organic sulfur-containing antioxidants in photoreceptors is well-known in the art to control the increase in residual potential and deterioration of characteristics of the photoconductor due to light irradiation. As discussed in the rejections in paragraphs 7 and 9 above, JP'250 teaches these advantages and other advantages of using its sulfur-containing compounds in the photosensitive layers in photoreceptors. See paragraph 7 supra. Thus, JP'250 provides motivation, reason, and suggestion to a person having ordinary skill in the art to use its sulfur-containing compounds in the photosensitive layers in the photoreceptors described by JP'998 and JP'890. Accordingly, for the reasons discussed in the rejections in paragraphs 7-10 above, the instantly claimed invention is rendered prima facie obvious over the combined teachings of the cited prior art.

In addition, the showings in Tables 14, 15, and 16 of the instant specification are insufficient to overcome the rejections because they fail to show that the instantly claimed photoreceptor yields unexpected results over the prior art of JP'998 and JP'890 for the following reasons:

(1) The showing in Table 16 is not commensurate in scope with the instant claims. The evidence in the instant specification is insufficient to show that the full scope of the instant claims yields unexpected results over the prior art.

Instant examples 6-10, 12-14, and 16 exemplify photoreceptors comprising aluminum drums having a diameter of 30 mm and an intermediate layer having a thickness of 3 μm. The photoreceptors in examples 6-10, 12-14, and 16 also comprise a charge transfer layer comprising 0.9 parts by weight of the particular organic sulfur-containing antioxidant S-1, S-2, S-3, III-3, or III-6 based on 100 parts by weight the of the charge transfer material.

(a) Instant independent claim 84 recites that the organic sulfur-containing compound is present in an amount of 0.9 to 5 parts by weight based on 100 parts of the charge transport material. The instant claims do not limit the amount of the organic sulfur-containing compound to be only 0.9 parts by

weight per 100 parts by weight of the charge transport material, as exemplified in the instant specification. Applicants have not explained why the limited showing of only one amount fairly represents the full scope of the amounts recited in instant claim 84. Thus, applicants' showing is not commensurate with the scope of the exclusion protection they seek.

(b) As discussed in the office action mailed on Aug. 27, 2003, paragraph 9, which is incorporated herein by reference, the Rule 132 declaration, which was executed by Yasuo Suzuki on Jul. 4, 2002 (Declaration-2002), and filed on Jul. 8, 2002, attributes the differences in black spot formation between examples comprising a drum having a diameter of 30 mm and an intermediate layer having a thickness of 3 μm and examples comprising a drum having a diameter of 80 mm and an intermediate layer having a thickness of 4.5 μm to:

(b-1) The difference in the layer thickness of the intermediate layer. As discussed in the office action mailed on Aug. 27, 2003, paragraph 9, the Declaration-2002 attributes the differences in black spot formation between comparative examples 5 and 13 of the instant specification and examples 8 and 15 of US 6,136,483 (Suzuki'483) to the differences in the thickness in the undercoat layer. (The photoreceptors in

comparative examples 5 and 13 and in Suzuki'483 examples 8 and 15 do not comprise any sulfur compounds.) The declarant states that "the underlayer layer, which is thicker in the Suzuki Examples (4.5 μm) than in the present Comparative Examples (3.0 μm), has a charge blocking property." The declarant further states that "the thicker the underlayer, the better the black spot formation." Thus, according to the declarant, the thickness of the intermediate layer appears to be a critical element to the reduction of formation of black spots. However, independent claim 84 does not limit the layer thickness of the intermediate layer to be only 3 μm. Instant claim 84 recites an intermediate layer thickness of "3 to 10 μm." Nor does instant claim 84 limit the aluminum drum to have any particular diameter. There is no credible evidence on the present record showing that photoreceptors that comprise a conductive drum having a diameter of 80 mm, such as those exemplified in the prior art, and an intermediate layer having a thickness 3.0 μm, would provide unexpected results in reduced formation of black spots. Indeed, the declarant's testimony indicates the contrary would reasonably be expected to be true.

(b-2) Furthermore, as discussed in the office action mailed on Aug. 27, 2003, paragraph 9, the Declaration-2002 attributes

the differences in black spot formation between comparative examples 5 and 13 of the instant specification and examples 8 and 15 of US 6,136,483 (Suzuki'483) to the differences in the photoreceptor drum diameter. The declarant states that "when Sukuzi's photoreceptor (having a diameter of 80 mm) produces 50,000 images [on A-4 paper], it revolves about 53,724 times," while the "photoreceptor used in the presence application revolves about 143,312 times to produce 50,000 images [on A-4 paper], because it has a diameter of 30 mm." The declarant further states that "the surface of the photoreceptor having a diameter of 30 mm is exposed to hazards by a factor of 2.67 times greater than that of the Suzuki photoreceptor having a diameter of 80 mm." The declarant states that "when black spots are observed after the 38,000th image in Comparative Examples of the present application, it is nearly equivalent to black spots being observed from about the 100,000th image in the Suzuki Examples." Thus, the diameter of the photoreceptor appears to also be a critical element in the formation of black spots. However, the independent claim 84 does not limit the aluminum drum as to diameter. The exemplification of a drum diameter of 30 mm in examples 6-10, 12-14, and 16 in the instant

specification is not commensurate in scope with the instant claims, which are not limited to any drum diameter.

Thus, both the diameter of the photoreceptor drum and the thickness of the intermediate layer appear to be critical elements in the prevention of formation of black spots. Independent claim 84 does not recite these critical and preferred elements.

(3) The instant specification does not compare adequately to JP'998 or to JP'890.

Comparative examples 5, 9, and 13, which comprise a charge generation layer comprising an asymmetric bisazo and a metal-free phthalocyanine pigment, comprise an aluminum drum having a drum diameter of 30 mm and an intermediate layer having a thickness of 3.0 μm.

As discussed supra, the intermediate layer thickness and the aluminum drum diameter appear to be critical elements in the formation of images free from black spots. Instant independent claim 84 does not limit the diameter of the aluminum drum.

As discussed in paragraphs 7 and 9 above, both JP'998 and JP'890 exemplify photoreceptors comprising an aluminum cylinder having a diameter of 80 mm and an intermediate layer having a thickness of 0.1 μm. See DERWENT translation and JPO

translation of JP'998, example 8 in paragraph 0047; the DERWENT translation of JP'890, example 8 in paragraph 0047. In addition, as discussed in paragraphs 7 and 9 above, JP'998 teaches that the intermediate layer may have a thickness of 10 µm, while JP'890 teaches that the intermediate layer may have a thickness of 5 µm. Both thicknesses are within the thickness range of 3 to 10 µm recited in instant claim 84. The instant claims do not exclude the drum diameter of 80 mm. The comparative examples do not exemplify such photoreceptors comprising drums having a diameter of 80 mm and an intermediate layer having a thickness of 10 or 5 µm. Accordingly, comparative examples 5, 9, and 13 in the instant specification are not a probative comparison to JP'998 or to JP'890.

Thus, given the welter of unconstrained variables and applicants' limited showings, applicants have not satisfied their burden to show that the full scope of the instantly claimed invention provides unexpected results over the prior art.

(4) Furthermore, the charge stability results ΔVD do not appear to be unexpected. As discussed supra, as admitted by applicants in the instant specification at page 4, lines 2-10, the use of organic sulfur-containing antioxidants in

photoreceptors is well-known in the art to control the deterioration of characteristics of the photoconductor due to light irradiation. As discussed in paragraphs 7 and 9 above, JP'250 teaches that its sulfur-containing compounds prevent the deterioration of the photoreceptor due to strong light irradiation. The photoreceptor is said to have improved potential stability over long periods of time. Table 1 of JP'250 shows that a photoreceptor comprising a charge transporting layer comprising its sulfur compound I-4, which is within the limitations of instant formula III, while n is 18, exhibits an initial electric potential before irradiation (Vs) of -627 V; and an electric potential after one hour irradiation with light of 1000 lx that differs from the Vs by 1 V (ΔVs). See the DERWENT translation of JP'250, paragraph 0026, sulfur compound (I-4), paragraph 0053 for ΔVs measurement, and Table 1 at page 38, example 1. JP'250 shows that a photoreceptor that has the same composition as that in example 1, but without the sulfur compound I-4, exhibits an initial electric potential before irradiation (Vs) of -645 V, but a ΔVs of -154 V. See Table 1, comparative example 1. Table 16 in the instant specification reports that the photoreceptor in example 8, which comprises the sulfur compound III-6, which is the same as JP'250

compound I-4, exhibits a ΔVD of 20V, while the photoreceptor in comparative example 5, which has the same composition as example 8, but no sulfur compound, exhibits a ΔVD of 100 V. See the instant specification, Table 1 at page 10, sulfur compound III-6, and Table 16, example 8 and comparative example 5. According to the instant specification at page 40, line 16, to page 41, line 1, ΔVD is the difference between the initial electric potential before irradiation of the photoreceptor and the electric potential after 60 minutes irradiation with light of 1000 lux. These experimental conditions appear to be the same as that used in JP'250. Thus, the change in magnitude between the ΔVs values reported in JP'250 for photoreceptors comprising or not comprising its sulfur compound appears to be the same or similar to the change between applicants' ΔVD values reported in Table 16 for photoreceptors comprising or not comprising the sulfur compound. Therefore, the results in ΔVD reported in the instant specification do not appear to be unexpected as alleged by applicants.

Accordingly, the rejections over the combined teachings of JP'998 and JP'250 and over the combined teachings of JP'890 and JP'250 stand.

12. Claim 84 is rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-5 of U.S. Patent No. 7,192,677 B2 (Suzuki"677) in view of US 5,965,311 (Suzuki'311), JP'250, Schaffert, and Tanigawa. See the DERWENT machine-assisted translation of JP'250 for cites.

Reference claim 4, which depends on reference claim 1, recites an electrophotographic photoconductor, also known in the electrophotographic arts as a photoreceptor, comprising an electroconductive substrate and a photoconductive layer comprising a phthalocyanine pigment and the asymmetric disazo pigment of the formula recited in reference claim 1. The phthalocyanine pigment is a metal free-τ-type phthalocyanine pigment or a metal free X-type phthalocyanine pigment. The phthalocyanine pigment and the asymmetric disazo pigment are present in an amount ratio by weight of 2.5:3.5 to 1:1, which is within the weight ratio range of 1:5 to 5:1 recited in instant claim 84. The phthalocyanine pigment meets the phthalocyanine pigment limitations recited in instant claim 84. The asymmetric disazo pigment meets the compositional limitations of formula (VII) recited in instant claim 84. (The examiner notes

that the disazo formula in reference claim 1 is incorrect due to printer's error. See allowed claim 53 in the amendment filed on Nov. 13, 2006, in the records of the patented file of Suzuki'677.) Reference claim 2, which depends on reference claim 1, requires that the photoconductive layer comprise a charge transport layer and a charge generation layer comprising the phthalocyanine pigment and the asymmetric disazo pigment. The layer structure meets the layer structure recited in instant claim 84.

The subject matter recited in the claims of Suzuki'677 does not recite the presence of an intermediate layer as recited in the instant claims. Nor does it require that the conductive substrate be an aluminum drum.

The use of an aluminum drum as the electroconductive substrate of a photoconductor is well known in the art. See Suzuki'311, col. 4, lines 56-60, col. 4, line 63, to col. 5, line 8, and col. 5, lines 62-64. Suzuki'311 teaches an intermediate layer that is located between the electroconductive support and the charge generation layer. The intermediate layer comprises a binder resin, first titanium oxide A particles having a primary particle diameter of 0.01 to 0.1 μm, and second titanium oxide B particles having a primary particle diameter of

0.1 to 1 μm. The intermediate layer has a thickness of 10 μm, which is within the layer thickness range of "3 to 10 μm" recited in instant claim 84. See col. 5, lines 45-48, and embodiment 1 (E1) at col. 5, lines 54-64. Suzuki'311 also teaches that the intermediate layer preferably has a thickness of 0.3 to 30 μm, which encompasses the layer thickness range of 3 to 10 μm recited in instant claim 84. Col. 4, lines 40-43.

According to Suzuki'311, when a photoconductor comprises its intermediate layer, the layer prevents the occurrence of interference fringes and image defects. The photoconductor provides excellent images. Col. 3, lines 13-15, and Table 1 at col. 7, example E1 and the accompanying text.

It would have been obvious for a person having ordinary skill in the art, in view of the teachings of Suzuki'311, to use the aluminum drum and the intermediate layer taught by Suzuki having a thickness as recited in instant claim 84, e.g., 10 μm, in the photoconductor recited in the claims of Suzuki'677. That person would have had a reasonable expectation of successfully obtaining an electrophotographic photoconductor that prevents the occurrence of interference fringes and image defects and that provides excellent images.

The subject matter recited in the claims of Suzuki'677 does not require the presence of an organic sulfur-containing compound in the charge transport layer as recited in instant claim 84.

JP'250 discloses sulfur-containing compounds that meet the compositional limitations of formulas (III-3), (III-6), (S-1), (S-2), and (S-3) recited in the instant claims. JP'250 discloses that said sulfur-containing compounds can be used as antioxidants in charge transport layers of photoreceptors. The discussion of JP'250 in paragraph 7, supra, is incorporated herein by reference.

It would have been obvious for a person having ordinary skill in the art to use JP'250's sulfur-containing compounds that meet the compositional limitations of formulas (III-3), (III-6), (S-1), (S-2), or (S-3) recited in the instant claims in an amount of 1.5 parts by weight per 100 parts by weight of the charge transport material, as an antioxidant in the charge transport layer in the photoconductor rendered obvious over the subject matter recited in the claims of Suzuki'677 combined with the teachings of Suzuki'311. That person would have had a reasonable expectation of successfully obtaining a photoconductor that has improved potential stability over long

periods of time and that provides stable toner images after many repeated copies.

The recitation, "the photoreceptor is suitable for a reverse developing method in an electrophotographic image forming apparatus which comprises a contact charger," in claim 84 is merely a statement of intended use that does not distinguish the photoconductor rendered obvious over the subject matter recited in the claims of Suzuki'677 combined with Suzuki'311 and JP'250. A recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. It is well known in the electrophotographic arts that that the "production of positive prints from line negatives requires only a change of the xerographic developing material." The discussions of Schaffert and Tanigawa in paragraph 7 above are incorporated herein by reference. As discussed above, the photoconductor rendered obvious over subject matter recited in the claims of Suzuki'677 combined with the teachings of the cited prior art meets the photoreceptor limitations recited in the instant claims. Thus,

on the present record, the intended use recited in instant claim 84 does not appear to result in a compositional or structural difference between the photoreceptor recited in the instant claims and the photoconductor rendered obvious over the subject matter recited in the claims of Suzuki'677 combined with the cited prior art.

13. Claim 85 is rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-5 of Suzuki'677 in view of Suzuki'311, JP'250, Schaffert, and Tanigawa, further in view of Kakuta and DERWENT abstract Acc. No. 1983-816039. See the DERWENT machine-assisted translation of JP'250 for cites.

The subject matter recited in the claims of Suzuki'677 in view of Suzuki'311, JP'250, Schaffert, and Tanigawa renders obvious an electrophotographic photoconductor as described in paragraph 12 above, which is incorporated herein by reference.

The claims in Suzuki'677 do not recite that the metal-free τ-type phthalocyanine recited in the reference claims has the X-ray diffraction pattern recited in instant claim 85. However, Kakuta discloses a τ-form metal-free phthalocyanine that appears to have an X-ray diffraction pattern as recited in the instant

claims. The discussion of Kakuta in paragraph 8, supra, is incorporated herein by reference.

It would have been obvious for a person having ordinary skill in the art to use Kakuta's τ-form metal-free phthalocyanine pigment as the metal-free phthalocyanine in the photoconductor rendered obvious over the subject matter recited in the claims of Suzuki'677 combined with the teachings of Suzuki'311, JP'250, Schaffert, and Tanigawa. That person would have had a reasonable expectation of successfully obtaining a photoconductor having improved sensitivity to the longer wavelength region, and having the benefits disclosed by JP'250.

14. Claim 86 is rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-5 of Suzuki'677 in view of Suzuki'311, JP'250, Schaffert, and Tanigawa, further in view of Byrne.

The subject matter recited in the claims of Suzuki'677 in view of Suzuki'311, JP'250, Schaffert, and Tanigawa renders obvious an electrophotographic photoconductor as described in paragraph 12 above, which is incorporated herein by reference.

The claims in Suzuki do not recite that the metal-free X-type phthalocyanine recited in the reference claims has the

X-ray diffraction pattern recited in instant claim 86. However, an X-form metal-free phthalocyanine pigment having an X-ray diffraction pattern recited in the instant claims is well known in the art, as shown by Byrne. The discussion of Byrne in paragraph 10, supra, is incorporated herein by reference.

It would have been obvious for a person having ordinary skill in the art to use the Byrne X-form metal-free phthalocyanine pigment having a X-ray diffraction pattern that meets the limitation of the instant claim as the metal-free X-type phthalocyanine pigment in the photoconductor rendered obvious over the subject matter recited in the claims of Suzuki'677 combined with the teachings of Suzuki'311, JP'250, Schaffert, and Tanigawa. That person would have had a reasonable expectation of successfully obtaining a photoconductor having improved sensitivity to the longer wavelength region, and having the benefits disclosed by JP'250.

15. Applicant's arguments filed on Apr. 16, 2008, as applicable to the rejections over Suzuki'677 in paragraphs 12-14 above have been fully considered but they are not persuasive.

Applicants assert that subject matter claimed in Suzuki'677 does not disclose or suggest the photoreceptor recited in

instant claim 84. Applicants further assert that the other cited references "do not cure the defects of the claims" in Suzuki'677.

Applicants' assertions are not persuasive. For the reasons discussed in the rejections in paragraphs 12-14 above, the photoconductor rendered obvious over the subject matter claimed in Suzuki'677 in view of the teachings in the cited prior art meets all of the photoreceptor compositional and physical limitations recited in the instant claims. Accordingly, the rejections in paragraphs 12-14 stand.

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Janis L. Dote whose telephone number is (571) 272-1382. The examiner can normally be reached Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Mark Huff, can be reached on (571) 272-1385. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Any inquiry regarding papers not received regarding this communication or earlier communications should be directed to Supervisory Application Examiner Ms. Sandra Sewell, whose telephone number is (571) 272-1047.

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Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Janis L. Dote/
Primary Examiner, Art Unit 1795

JLD
May 6, 2008